

stance was a rainfall of 1.19 inch at Parsonstown on June 10 and no rain whatever at any other of the telegraph stations of the Meteorological Office in this country. Heavy local rains of this type, with downpours of an inch or upwards, were recorded on May 17, 18, 20, and 21, and June 10. It is also to be noted that many thunderstorms occurred during the period unaccompanied with rain, just as happened generally in the east of Scotland in June 1887, on the day of the Queen's Jubilee; and frequently large drops of rain fell, quite insufficient even to wet the ground, and scattered over narrow paths of inconsiderable length. Very heavy rains occurred over the eastern districts of Scotland, practically terminating the drought there, on June 22 and 23, when on these two days 4.20 inches fell at the North Esk Reservoir on the Pentland Hills, 3.32 inches at Roslin, 2.21 inches at Aberdeen, 2.06 inches at Logie Coldstone, near Ballater, and nearly two inches at many places, whilst generally in the west little and at many places no rain fell at all.

Temperature was phenomenally and almost continuously high in March, April, May, and June, specially as regards the first three of these months. Thus, for London the mean of the three months was $4^{\circ}3$ above the mean of the previous 130 years; and in Edinburgh $3^{\circ}3$. The only springs since 1763 with a mean temperature exceeding that of 1893 were for London, 1811 and 1794, which were respectively $5^{\circ}2$ and $4^{\circ}3$ above the average; and for Edinburgh, 1779 and 1781, which exceeded the mean by $4^{\circ}0$ and $3^{\circ}8$. It is highly interesting to note that large as these figures are, the Ben Nevis figures far exceed them, the mean temperature at this high-level observatory for March, April, and May last being $6^{\circ}6$ above the mean of these months, a result due to the prevailing anticyclones, which so frequently are attended there with abnormally high temperatures.

The drought has also extended over nearly the whole of Europe, large portions of Canada, the United States, and other parts of the globe. In the north of Italy no living person recollects to have seen the Italian Lakes so low, and the southern Alps so greatly denuded of their snow covering. It is estimated that over the wheat-growing countries of the world this valuable crop will be to no inconsiderable extent under the average. On the other hand, in other parts of the world the rainfall has been exceptionally heavy, and followed with widespread disastrous floods, as in the cotton districts of the United States, and in Queensland.

In London, the total amount of rain that fell during the 110 days from March 4 to June 22 was 0.77 inch. Mr. Symons, our best authority on the question of droughts, enumerates eight droughts which have been recorded during the present century. Of these the longest continued was 105 days, from March 11 to June 23, 1844; and thus the drought of the present year is the greatest in the British Islands authenticated by meteorological records.

NICOLAS IVANOVICH LOBATCHEFSKY.

NICOLAS IVANOVICH LOBATCHEFSKY, the founder of Non-Euclidean Geometry, was born on November 2, 1793.

A student, and subsequently professor at Kasan, the Physico-Mathematical Society of that interesting University have determined to celebrate the centenary of his birth by founding an International prize for Mathematical, and in particular, for Geometrical work bearing upon the late-born but remarkable branch of mathematical science and philosophy which owes its existence to Lobatchefsky's genius and has earned for him the title of the Copernicus of Geometry.

A committee including the names of Tchebyche, Poincaré, Hermite, Darboux, Klein, Sophus Lie, Linde-

mann, Cayley, Beltrami, Newcomb, Mittag-Leffler, and over a hundred other notabilities of the mathematical world in both hemispheres, has been appointed to assist in carrying out the plan.

At this time of day it would be superfluous to dilate on the pre-eminent claims to honourable recognition of one who has played a principal part in reconstituting the basis of geometrical thought and realised his ideas in a series of memoirs with a thoroughness and precision which Gauss in 1846 characterised as the work of "a true geometer."

Any English mathematician (and it is to be hoped there will be many) desirous of co-operating in erecting this monument (if it may be so called) to the memory of a great scientific reformer, may do so by forwarding a subscription addressed to Prof. Vassilief, President of the Physico-Mathematical Society, University of Kasan.

NOTES.

WE greatly regret to record the death of Dr. John Rae, F.R.S., at the age of eighty-one. It was he who, in 1854, collected relics of the ill-fated Franklin expedition in the *Errebus* and *Terror*.

AMONG the Civil List pensions granted during the year ending June 20, 1893, we note one of £75 to Mrs. Dittmar, in consideration of the services to chemical science rendered by her late husband, Prof. William Dittmar, F.R.S., and one of £50 to Mrs. T. Wolstenholme, in consideration of the merits of her husband, the late Rev. Joseph Wolstenholme, as a mathematician, and of her straitened circumstances.

FOR the convenience of those who wish to be present at the Rothamsted celebration on Saturday next, a special train will leave St. Pancras for Harpenden at 2.2 p.m., returning at 5 p.m. In connection with the celebrations at Rothamsted, it is interesting to recall the circumstance that in the early part of the present century the signal services rendered by Francis, Duke of Bedford, to the theory and practice of agriculture were recognised by the erection, in Russell Square, of a colossal statue to his memory. The scheme, in the first instance, was initiated by Sir Joseph Banks, then president of the Royal Society, the first meeting on the subject being held at his house in Soho Square. Subscriptions were solicited from the various agricultural societies existing at the time, and from private individuals, and these flowed in with many expressions of approval of the object in view. The statue and its pedestal, the latter emblematical of the art of husbandry, were designed by Richard Westmacott, who received the sum of £6000 for the work, each subscriber receiving an engraving of the design. An inscription records that the statue to the Duke was erected by his fellow labourers in the field of agricultural improvement in gratitude for his unwearied endeavours to improve the theory and practice of agriculture.

THE French Association for the Advancement of Science will hold its annual meeting from August 3 to August 13, at Besancon, under the presidency of Dr. Bouchard. The subjects for discussion in different sections are the mechanical traction of tramways, the local records from which a forecast of the weather at a given place can be made, the rôle of humus, works of commerce, and the administrative measures necessary to prevent the use of unfit articles of food.

THE death is announced of Mr. Walter White, who for upwards of forty years served the Royal Society, first in the capacity of clerk and afterwards of assistant secretary and Librarian. Mr. White retired from the latter post in 1885, and

has from that time received a pension from the society. His bent was literary rather than scientific, and he was the author of several books of holiday travel written in a pleasant style and in that correct English upon which he always prided himself. Mr. White died on Friday last, in the eighty-third year of his age.

THE annual congress of the British Institute of Public Health will be held at Edinburgh from July 27 to August 1, under the presidency of Dr. Henry D. Littlejohn and the auspices of the Lord Provost and Corporation of Edinburgh.

THE Société Belge de Géologie et d'Hydrologie has arranged an excursion of some interest for August 4 to 9, under the direction of M. E. Dupont, the special object being to study the hydrology of the district around Dinant, Namur, Rochefort, Madave, &c. The springs and surface-streams will be examined, and also the famous Grotte de Han. Attention will also be paid to other physical features of the districts, including the formation of valley-terraces and the origin of the loam on the plateaux.

THE annual exhibition of the Photographic Society of Great Britain will be held at the Gallery of the Royal Society of Painters in Water-Colours, Pall Mall, from September 25 to November 15. It will be opened by a reception held by the President, Capt. Abney. The last day for receiving pictures is September 11.

THE Aspatia Agricultural College, which has been rebuilt and greatly enlarged, was opened on July 21 by the Mayor of Carlisle, before a large and representative gathering.

A STATUE of Claude Chappe, the inventor of the system of semaphore signalling, has recently been erected on the Boulevard Saint-Germain, Paris.

THE Société Industrielle de Mulhouse has issued its programme of prizes to be awarded in 1894. Prizes will be given for works on the constitution of various colouring matters, mordants, dyes, the fixing of colours, areometry, drugs, bleaching, actinometry, and other subjects. In mechanical arts the prize-subjects relate to building construction, steam engines, motors, spinning and weaving, electric motors, and the comparative advantages of gas and electricity for lighting purposes. There are also prizes for subjects of natural history and agriculture, commerce, statistical and historical geography, and the fine arts. The prizes are open to persons of all nationalities. Competitors should send in their memoirs, plans, and specimens, marked with a pseudonym or motto before February 15, 1894, to the President of the Society. The same pseudonym or motto, with the full name of the sender, must be forwarded under separate cover at the same time. A detailed programme of subjects for which prizes will be awarded, can be obtained by application to the Secretary of the Society, Mulhouse, Alsace.

WHEN it was resolved last January "That it is desirable that the eminent services of the late Sir Richard Owen in the advancement of the knowledge of the sciences of anatomy, zoology, and palæontology should be commemorated by some suitable memorial," it was confidently expected that there would be a generous response to the appeal for funds. A large number of circulars were sent out, yet the list published in June contains the names of less than 300 contributors. The donations then amounted to £935, and the amount promised has even now only reached £1000, whereas the committee hoped to obtain at least twice that sum. For those who have come forward there is nothing but praise; the cause of complaint lies in the paucity of subscribers. Only 300 admirers of Owen can be found desirous of giving concrete expression to their feelings of regard. The fact is humiliating, and, for the sake of British science, we trust it will soon be altered. Of Sir

Richard Owen it can truly be said, that among students of science "Many shall commend his understanding; and as long as the world endureth, it shall not be blotted out; his memorial shall not depart away, and his name shall live from generation to generation." But Owen's greatness should not only be appreciated by men of science, it should be made known to the world by means of a monument. As a mark of respect to their master and an act of duty, all naturalists should add a stone to his cairn.

ONE of the conclusions arrived at in 1888 by the Commission appointed to investigate the action of light on water colours, was that "every pigment is permanent when exposed to light 'in vacuo,' and this indicates the direction in which experiments should be made for the preservation of water-colour drawings." Actuated by this expression of opinion, Mr. W. S. Simpson has devised a simple and effective means whereby works of art can be isolated from the deteriorating effects of air and moisture. The picture which it is desired to preserve is placed face downwards in a shallow rectangular tray having a clear glass bottom, and is then covered at the back. The chamber thus formed is afterwards exhausted by means of a Sprengel pump, and hermetically sealed. Assuming that no leakage occurs, and that light has no intrinsic action upon pigment, the picture will be preserved in all its pristine beauty until the crack of doom. To test for leakage, a small manometer, constructed on the principle of the aneroid barometer, can be fixed to each isolated picture. Mr. Simpson's idea is a good one, and it possesses the inestimable advantage of being applicable to any picture, for all that is required is to take the picture from its frame and fit it into an airtight chamber of the same size before replacing it. Should the vacuum not maintain its integrity, the manometer will indicate its imperfections, and the chamber can easily be exhausted again. It appears, therefore, that the method has great possibilities before it.

WITH regard to the statement made by Mr. E. Douglas Archibald in our issue of May 25, that the highest rainfall in twenty-four hours was 40·8 inches, registered at Chirapunji, in the Khasi hills, a correspondent writes to the *Ceylon Observer* as follows:—"If the *Indian Planters' Gazette* of 28 Jan., 1893, is correct, the following paragraph establishes a still higher record. On page 59 one reads: 'Our Dera Doon correspondent writes on January 24, 1893: last night we had 48 inches of rain, and all the hills are covered with snow. It is still raining.' For this to have any scientific value, however, it must be known who were the observers, and by what means the rainfall was gauged.

THE duration and form of temperature waves as they occur at Trieste has been studied by Herr Ed. Mazelle, and described in a recent communication to the Vienna Academy. Daily records during the period from 1871 to 1890 show a mean wave length of 4·23 days. The longest waves occurred in winter and summer, the shortest in spring and autumn at Trieste, in marked contrast to Central Europe, where the reverse occurs. The mean duration of increase of temperature was always longer than that of fall of temperature, in the proportion of 2·39 to 1·84. For dull days both the periodic and the aperiodic diurnal variation were of less extent, but both the maxima and minima of temperature occurred earlier in the day. The variability of mean daily temperatures was different for different parts of the year, showing maxima in January and July, and minima in September and April. The occurrence of the first day of frost was found to vary between wider limits than that of the last frost.

THE German Meteorological Office has issued a volume containing the results of rainfall observations for the year 1891,

together with a circular stating that the number of meteorological stations has so greatly increased as to make it advisable to publish five volumes yearly instead of one, two of which will be devoted to the magnetical and meteorological observations made at the Observatory at Potsdam. The number of rain stations has increased from 35 to 1425 since the establishment of the office in the year 1847. In addition to the usual monthly and yearly summaries, the greatest amounts which have fallen in short intervals are given for a large number of stations. These values show clearly how the intensity of the fall decreases with the duration, and that erroneous ideas may be obtained by estimating the hourly fall from that of a shorter period, as is sometimes done. The greatest fall during five minutes in the year 1891 amounted to '15 inch per minute, during thirty minutes to '08 inch per minute, and during one hour to '04 inch per minute. The greatest fall registered in any one day was 4'3 inches on the May 26; a fall of 4'2 inches was also recorded on July 21.

SOME idea may be formed of the rate of increase of the known species of fungi from the fact that, in a recent issue of the Proceedings of the Philadelphia Academy of Sciences, MM. Ellis and Everhart describe no less than 149 new species from North America. Of these 53 belong to the Pyrenomycetes, 24 to the Discomycetes, 11 to the Uredineæ, 2 to the Ustilagineæ, 46 to the Sphærospideæ, 13 to the Hyphomycetes.

A FLORA of Donegal, by Mr. H. Chichester Hart, is about to be published. Until recent years the north-west of Ireland had been greatly neglected by botanists, and the publication is likely, therefore, to be of much interest.

THE first part of MM. Rouy and Foucaud's "Flore de France" is announced to appear in August. The geographical area of the work includes, in addition to France proper, also Alsace, Lorraine, and Corsica; and there will be comprised a bibliography and a list of botanists who have contributed to our knowledge of the flora of France. The first volume of M. Bounier's "Flore de la France," published under the auspices of the Ministry of Public Instruction, is expected to appear in the spring of 1894.

TWO recent numbers of the *Botanisches Centralblatt* (vol. liv. nos. 12 and 13) are largely occupied by a review by Dr. Otto Kuntze of the discussion on botanical nomenclature since the publication of his "Revisio generum plantarum" in 1891.

MR. MARK STIRRUP has just published further information as to the occurrence of boulders in the coal measures of Lancashire (Trans. Manchester Geol. Soc., vol. xxii. p. 321). Most of the boulders hitherto recorded are of quartzite; some of those here described are of crystalline rock. Petrographical notes are given by Prof. Bonney. Mr. Stirrup also prints a letter from Prof. E. Orton relating to the occurrence of boulders of vein-quartz—not quartzite—in the coal measures of Ohio (see also *Amer. Journ. Sci.*, July 1892).

BOULDERS have been recently described from the Kulm beds of the Frankenwald, by E. Kalkowsky (*Zeitsch. Deutsch. geol. Gesell.* 1893, p. 69), who thinks that they indicate glacial action. This explanation is not satisfactory for the English boulders in coal measures, the origin of which is still unknown.

PROF. FRANK D. ADAMS has published an interesting description of the Norian Rock of Canada ("Ueber das Norian oder Ober-Laurentian von Canada" extracted from *N. Jahrb.*, Beilagebd. viii., 1893, pp. 419-498). This forms a thesis for the doctor's degree at the University of Heidelberg. The Norian rocks consist mainly of "anorthosite," in which plagioclase is the chief constituent, ferro-magnesian silicates

being scarce or absent. These rocks are intrusive in the Grenville series—the upper division of the Lower Laurentian of Logan, who regarded the Norian series as Upper Laurentian. Prof. Adams shows that the anorthosites occur near the eastern edge of the great Archæan platform of Canada. He compares this with the distribution of modern volcanoes along the edges of the Continents. Some of the anorthosite masses are of great extent; that of the Saguenay district covers an area of nearly 6000 sq. miles, that of Morin 1000 sq. miles. These results may be compared with the conclusions already published by Prof. A. C. Lawson, that the Laurentian gneisses of the Rainy Lake region are intrusive in the so-called "Huronian" of that area, rocks which were previously considered to be later than the Laurentian. Prof. Adams's paper contains a map of the Archæan area of Canada and a full bibliography.

EXPERIMENTS on the value of ammonia vapour as a disinfectant have been recently made by Rigler (*Centralblatt für Bakteriologie*, vol. xiii. No. 20). The organisms employed were Koch's cholera bacillus, the typhoid bacillus, Loeffler's diphtheria bacillus, and the spores and bacilli of anthrax. Threads soaked in broth-cultures of these various organisms were freely exposed in a room filled with ammonia vapour, whilst other threads were wrapped up in dry and damp cloths respectively before being submitted to the vapour, and in every case control threads were simultaneously exposed to air. It was found that cholera bacilli were killed after two hours' exposure in the ammonia room, whether free or enclosed in dry cloths, whilst twice that time elapsed before they succumbed in moist surroundings. In ordinary air they were destroyed in three hours, but they were alive after two days when kept in moist cloths. Two hours' exposure in the ammonia vapour, whether freely exposed or in dry wrappers, sufficed to destroy the typhoid bacilli, but in moist surroundings six hours was necessary, whilst twenty-four hours' contact with ordinary air produced no effect upon them. Anthrax bacilli succumbed in three hours in the ammonia room, but their existence was prolonged for five hours when wrapped in dry cloths, whilst whether in dry or moist surroundings a day's exposure in ordinary air left them untouched. The spores, however, were only destroyed after being eight hours in the ammonia vapour, and in ordinary air were unaffected. Diphtheria bacilli, whilst surviving twenty-four hours' contact with ordinary air, were annihilated in four hours by the ammonia vapour, the nature of their environment making no difference in their powers of resistance. In consequence of its efficacy, cheapness, and harmless character as regards furniture and clothing, Rigler recommends ammonia vapour as an important means of disinfection.

THE metric measures are in general use in Russia in scientific literature. They have also been adopted by the Mining Administration in all its publications, while the railway and water communications engineers are using the decimal divisions of the Russian *sagène* (7 English feet). Prof. Petrushevskiy, who has advocated since 1868 the adoption of metric measures, now gives in the Journal of the Russian Chemical and Physical Society his scheme of metric measures, as near as possible to the present Russian measures, so as to make them easily acceptable to the population. It must be said that the general use of the *schoty* (reckoners, made of wires with ten beads on each wire, and used by all peasants, as well as by primary schools for the teaching of arithmetic) and the decimal division of money would greatly facilitate the acceptance of the metric system in Russia. The change is also facilitated by the fact that the Russian *sagène* is very nearly equal to 2 metres, the *verst* is nearly equal to the kilometre, and the *desiatina* differs but little from the hectare. The system proposed by Prof. Petrushevskiy is both plain and at

once intelligible. It is that the *new sagène* shall be equal to the double metre (0·9374 of the present measure) and that a *half sagène* equal to one metre shall be divided into 20 *vershoks* (5 cm. are equal to 1·1248 of the present *vershok*). Also that the new *versta* shall be equal to the kilometre (0·9374 of the present *versta*), the *small desiatina* to the hectare and to 0·9153 of the present *desiatina*; the *big cube* to 10 cubic metres and to 1·0296 cubic *sagènes*; the *small vedro* to 10 litres and to nearly four-fifths (0·0131) of the present *vedro*; the *big measure* (1000 litres) to nearly five (4·795) *tehetveriks*; and finally the *big pound* (500 grammes) equal to 1·221 Russian pounds. It will be seen that the whole system is consistent with the spirit of the metric system, which fully admits of measures obtained from the multiplication of the metric ones by 2, 5, or 10, or from their divisions by the same members.

SIGNOR RICCARDO ARNÒ has communicated to the Reale Accademia delle Scienze di Torino his results obtained during an investigation of the diathermanous power of ebonite for heat waves of various lengths. He employed six different sources of light, whose radiant heat was sent through plates of ebonite of thicknesses varying from 0·12 to 0·52 mm. The thinnest of these absorbed 25 per cent of the heat radiated from an incandescent lamp, whose luminous heat rays were cut off by a thick plate of glass. When the source of light was very bright, this film was found to transmit a small portion of the visible red rays. Sixty-nine per cent. of the dark rays from the smoked surface of a Leslie cube containing boiling water were absorbed by the thinnest film, and 88 per cent. by the two others, thus showing that ebonite is less transparent for dark heat rays of low refrangibility than for those more approaching the visible spectrum. The greatest transparency was shown for the dark heat rays on the border of the luminous spectrum. The successive substitution of a hot iron plate, a glowing platinum wire, a Locatelli lamp, and an incandescent lamp for the Leslie cube brought about a steady increase of transmitting power in all the specimens of ebonite.

PROFS. BARTOLI AND STRACCIATI have brought their eight years' work on the specific heat of water to a close by reducing the values obtained with the nitrogen thermometer as a standard to the scale of the hydrogen thermometer. The corrected formula for the quantity of heat necessary to raise the temperature of 1 gramme of water from 0° to t° C., where t is less than + 31, as given in the *Rendiconti* of the Reale Istituto Lombardo, is

$$1\cdot006880t - 278 \times 10^{-6}t^2 - 205 \times 10^{-8}t^3 + \\ 25375 \times 10^{-11}t^4 - 26 \times 10^{-10}t^5.$$

This formula, obtained by eight different methods and several thousand determinations, appears capable of serving as a reliable basis for calorimetrical science.

IN a further note contributed to the Academy of Lincei, Augusto Righi continues the description of experiments he has conducted with electrical oscillations of very small wave-length (see NATURE, June 22, 1893). The oscillator employed consists of two small metal spheres surrounded with oil and held by two rods of ebonite. These two spheres are placed between the discharging rods of a large Holtz electrical machine. With spheres 4 cm. in diameter the wave-length of the radiation obtained was 20 cm., while with spheres of 1·3 cm. diameter the wave-length was about 7 cm. The resonator employed was of a novel form and was made by taking a rectangular piece of ordinary silvered glass of such a size that its breadth was equal to the length of the resonator required. The varnish was then dissolved off the back of the silver, and a line drawn through the silver by means of a diamond, so as to divide the strip of silver into two equal parts, and form a spark gap. By this means a spark gap was obtained, having a breadth of between one and two thousandths of a millimetre. For radiation having a wave-length of 7·5 cm. the resonator

was composed of a strip of silver 3·9 cm. long and 0·2 cm. broad. Although with these small wave-lengths the sparks cease to be visible when the distance between the oscillator and resonator is a metre, by placing a parabolic metallic reflector behind the resonator the sparks were visible at a distance of six metres from the oscillator. Using the above form of apparatus the author has repeated the experiments of Lodge and Howard and others on the reflection and refraction of electrical waves, he has also succeeded in producing interference between the rays reflected from two mirrors inclined at a slight angle (Fresnel's experiment). An interesting set of measurements of the transparency of various dielectrics gave (amongst others) the following results:—Ebonite, paraffin, and rock salt are perfectly transparent. A plate of mica 1·7 mm. thick absorbs 10% of the radiation, while a plate of ordinary glass 8 mm. thick absorbs 37%, and a piece of quartz cut normally to the axis 8 mm. thick absorbs 40%.

WE have received the first part of "The Book of the Fair," by Mr. Hubert Howe Bancroft. It is grandiloquently described on the title-page as "An Historical and Descriptive Presentation of the World's Science, Art, and Industry, as viewed through the Columbian Exposition at Chicago in 1893. Designed to set forth the Display made by the Congress of Nations, of Human Achievement in Material Form, so as the more effectually to illustrate the Progress of Mankind in all the Departments of Civilised Life." The part of the book before us deals with great fairs of the past, and the history of Chicago, the object apparently being to make the story as long as possible. Both the text and illustrations are excellent.

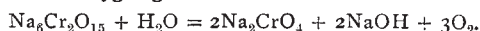
A COLLECTION of meteorological tables, compiled by Dr. Arnold Guyot, was issued by the Smithsonian Institution in 1852. The fourth edition was published in 1884, and the work had then grown to a bulky tome of more than 700 pages. Upon a demand for a fifth edition, Prof. S. P. Langley decided to publish the tables in three parts: Meteorological Tables, Geographical Tables, and Physical Tables, each independent of the other, but the three forming a homogeneous series. The volume of meteorological tables is before us, and it is of far more handy dimensions than formerly. Everything appertaining to meteorological work appears to be contained therein, and the fact that the work comes from the Smithsonian Institution vouches for its excellence. Our attention has been directed to a slip on p. 248. In the list of meteorological stations in the British Isles given on that page we find printed "Richmond (*Greenwich Observatory*)," lat. 51° 29' N., long. 0° 0'. The first word should be omitted in future editions, for Greenwich, and not Richmond, is obviously referred to.

NINETEEN charts of the "Isle of Wight and Solent Tides," from Portland Bill to the Owers, have been prepared by Mr. T. B. C. West and Mr. F. Howard Collins, and are published by Mr. J. D. Potter, Poultry, E.C. They show by means of arrows the direction of tidal streams at all hours, and, at some places, for half hours of the tides. The rates given are for spring tides, but those for neap and average tides can easily be estimated. The charts are excellently engraved from an Admiralty chart, and the arrows are placed in accordance with the information contained in the "Channel Pilot." They are issued in an extremely compact form, and to the yachtsman of the Isle of Wight district must prove invaluable.

"EVOLUTION AND RELIGION," by Mr. A. J. Dadson, has been published by Messrs. Swan, Sonnenschein and Co. The first three chapters of the book are concerned with the doctrine of evolution, and the remainder deal with theological matters, while the whole has been written with the laudable object of bringing about a reconciliation between religion and science. May the truth prevail.

MESSRS. WEST, NEWMAN, & CO., have just published a book by Mr. S. T. Dunn on the flora of South-West Surrey, including Dorking, Godalming, Farnham, and Haslemere. The last flora including this district was Brewer's, dated 1863. Another county flora is in preparation by Mr. W. H. Beeby. It need scarcely be said that Mr. Dunn's little book is not intended to take the place of these more complete floras, but it will serve as a portable field guide to visitors.

THE sodium salt of the as yet little-known perchromic acid has been isolated by Dr. C. Häussermann in the state of well-defined crystals, and is described in a communication to the current number of the *Journal für Praktische Chemie*. The possibility of the existence of an acid-forming oxide of chromium higher than the trioxide CrO_3 has formed a subject of discussion for many years. It was long considered that the deep blue coloration produced upon adding hydrogen peroxide to a solution of chromic acid was due to the formation of the hydrate of a peroxide of chromium. Both the first observer of this interesting reaction, Barreswill, and Ascher in a subsequent memoir, considered the peroxide to possess the composition Cr_2O_7 , corresponding to the heptoxide of manganese, Mn_2O_7 present in the permanganates. Fairley has since attributed to the blue compound the composition $\text{CrO}_6 \cdot 3\text{H}_2\text{O}$. Latterly, however, Moissan has adduced evidence in support of the view that the substance is nothing more than a molecular compound of chromic anhydride with hydrogen peroxide, $\text{CrO}_3 \cdot \text{H}_2\text{O}_2$. The work of Häussermann is therefore particularly interesting as showing that, whatever may be the truth concerning the blue compound above referred to, a higher acid of chromium is capable of existence. Moreover, it is not without some significance that the formula of the anhydride derived by Häussermann from the analyses of his sodium salt coincides with that, CrO_6 , attributed by Fairley to the oxide present in the blue compound. Häussermann finds that when sodium peroxide is added in small quantities at a time to chromic hydrate suspended in a small quantity of water and maintained at a low temperature by means of an ice bath, a somewhat violent reaction occurs, rendering constant agitation necessary; the chromic hydrate dissolves, a brownish-yellow solution being produced. When this liquid is allowed to stand undisturbed for a time in a cold room, brilliant brownish red, transparent, monoclinic crystals separate. These crystals are found upon analysis to possess the composition $\text{Na}_6\text{Cr}_2\text{O}_{15} \cdot 28\text{H}_2\text{O}$. They rapidly effloresce upon exposure to the air, falling to a brown powder. They lose the whole of their water of crystallisation when placed in a desiccator over oil of vitriol, or when heated to 100° . At a temperature of 170° they explode with some violence, leaving behind a quantity of sodium chromate mixed with sodium hydrate. The anhydrous salt is tolerably stable and is only very slowly attacked by cold water. Hot water, however, immediately decomposes it with formation of a solution of sodium chromate and sodium hydrate and liberation of three molecular equivalents of oxygen gas.



Analyses of the anhydrous salt agree with the formula $\text{Na}_6\text{Cr}_2\text{O}_{15}$, indicating an anhydride of the composition Cr_2O_{12} or CrO_6 . It is most interesting that, upon the addition of dilute sulphuric acid to the salt, the deep blue coloration above alluded to is at once produced, as if it were due to the formation of the free acid, the hydrate of CrO_6 . In a few minutes oxygen commences to be evolved, and chromic sulphate is formed in the solution. Alkalies are practically without action upon the salt, which would thus appear to be stable in alkaline solution.

NOTES from the Marine Biological Station, Plymouth.—Last week's captures include a colony of a tall ($1\frac{1}{2}$ ins.) variety of the

Hydroid *Coryne vermicularis*, Hincks, the Polyzoan *Pedicellina echinata*, and the Tunicata *Phallusia mammillata* and *Ascidia depressa*. An incursion of the Cladocera *Podon* and *Eviadna* has characterised the floating fauna; and with these have been taken Cirrhipede *Nauplii*, *Cyphonautes* larvæ, and countless numbers of minute *Obelia* medusæ. The following animals are now breeding:—The Cephalopod *Sepiolo atlantica*, the Malacostraca *Chelura terebrans*, *Limnoria lignorum* and *Eupagurus Prideauxii*, and the Echinoderm *Echinus acutus*.

THE additions to the Zoological Society's Gardens during the past week include two Great Eagle Owls (*Bubo maximus*), European, presented by Lord Hill; two Barbary Turtle Doves (*Turtur risorius* var.) from the Pescadore Islands, China, presented by Mr. Theodore A. W. Hance, C.M.Z.S.; three Giant Toads (*Bufo marinus*) from Brazil, presented by Mr. Adamson; a yellow-cheeked Lemur (*Lemur xanthomystax*) from Madagascar, a Banded Ichneumon (*Herpestes fasciatus*) from West Africa, deposited; a Black Ape (*Cynopithecus niger*) from the Celebes; two Black-headed Mynahs (*Temenuchus pagodarum*), two Manyar Weaver Birds (*Ploceus manyar*), two Red-headed Buntings (*Emberiza luteola*) from India, purchased; two Dominican Gulls (*Larus dominicus*) bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

THE DISCOVERY OF THE NEW COMET.—The new comet seems to have been noted by a number of observers before they had seen its discovery announced. Mr. Edgar Richards writes to us as follows in a letter dated July 13:—

"On Sunday last, the 9th inst., at 9.30 p.m., the members of the Astronomy Club, composed of several of the lady guests of the Cliff House, Minnewaska, N.Y., U.S.A., saw in the north-western heavens a most brilliant comet with well-defined nucleus and bright tail. The comet was in the constellation Lynx, and its tail extended towards the North Star. Its motion was very rapid in a south-westerly direction, and the tail was momentarily increasing in length as long as the comet was visible. The Club suffers from the disadvantage of not possessing a good telescope, so observations have to be made unassisted. No notice in the newspapers of such a comet having been seen and noted, the ladies were filled with enthusiasm to be, as they supposed, its first discoverers."

"Monday night the comet was found to be near the feet of the Great Bear, and much diminished in brilliancy, proving that it was rapidly receding from the earth."

It seems desirable, for the sake of cometary history, to give the following translation of a note by M. Tisserand in *Comptes Rendus*, No. 3.

"On the 10th July last, in the morning, I received a telegram from M. Quénisset, of the staff of the Juvisy Observatory, announcing that he had the previous night, the evening of the 9th July, discovered a bright comet, visible to the naked eye, whose approximate co-ordinates he gave. I at once transmitted a telegram to Kiel. The following morning, July 11, there came a telegram from Kiel, announcing that the comet had been seen on July 8 at Utah, U.S.A., by Mr. Rordame. It is therefore certain that Mr. Rordame has discovered the comet, but that M. Quénisset has announced it first. Perhaps it will be convenient to call it the Rordame-Quénisset comet; there are analogous precedents."

COMET FINLAY (1886 VII.).—The following is the ephemeris of this comet for the present week:—

12h. <i>Paris Mean Time.</i>					Decl. (app.)
		R.A. (app.)			
1893.		h.	m.	s.	
July 27	...	5	1	13.6	+ 21 47 39.8
28	...		5	26.9	21 56 13.6
29	...		9	38.5	22 4 19
30	...		13	48.3	22 11 56.4
31	...		17	56.2	22 19 6.1
Aug. 1	...		22	2.4	22 25 48.6
2	...		26	6.6	22 32 4.6
3	...	5	30	9.0	22 37 54.4